

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 Claim 1 (currently amended): A method for removing a metallic layer formed from at  
2 least one metal from ~~the~~ a surface of a ceramic substrate, said method comprising  
3 the step of immersing the ceramic substrate coated with the metallic layer in an acid  
4 solution of up to ~~about~~ 31% hydrochloric acid by volume for a time to substantially  
5 remove the metallic layer therefrom.

1 Claim 2 (original): The method of Claim 1, wherein the acid solution comprises  
2 hydrochloric acid at a concentration of about 31 % by volume of the solution.

1 Claim 3 (original): The method of Claim 1, wherein the metallic layer further  
2 comprises a composite layer formed from an aluminum coating in contact with the  
3 ceramic substrate and a tantalum deposition overlaying the aluminum coating.

1 Claim 4 (original): The method of Claim 2, further comprising subsequent to said  
2 immersing step, the step of annealing the ceramic substrate at a predetermined  
3 temperature sufficient to at least reduce pre-existing damage in the surface of the  
4 ceramic substrate.  
5

1 Claim 5 (original): The method of Claim 3, further comprising subsequent to said  
2 immersing step, the step of annealing the ceramic substrate at an elevated  
3 temperature sufficient to at least reduce pre-existing damage in the surface of the  
4 ceramic substrate via annealing.

1 Claim 6 (original): The method of Claim 4, wherein the annealing step further  
2 comprises ramping the temperature using at least one predetermined heating ramp  
3 rate.

1 Claim 7 (original): The method of Claim 5, wherein the annealing step further  
2 comprises ramping the temperature using at least one predetermined heating ramp  
3 rate.

1 Claim 8 (original): The method of Claim 1, further including subsequent to the  
2 immersing step, the step of immersing said substrate in an acid bath containing a  
3 solution of nitric acid ( $\text{HNO}_3$ ) and hydrofluoric (HF) acid to remove stains.

1 Claim 9 (original): The method of Claim 8, wherein the acid bath contains equal parts  
2 of water, nitric acid, and hydrofluoric acid.

1 Claim 10 (original): The method of Claim 2, further including subsequent to the  
2 immersing step, the step of immersing said substrate in an acid bath containing a  
3 solution of nitric acid ( $\text{HNO}_3$ ) and hydrofluoric (HF) acid to remove stains.

1 Claim 11 (original): The method of Claim 10, wherein the HNO<sub>3</sub>/HF acid bath  
2 contains equal parts of water, nitric acid, and hydrofluoric acid.

1 Claim 12 (original): The method of Claim 6, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of about 302°F at a first heating ramp rate of  
4 about 122°F/hour;  
5 maintaining the first temperature for about an hour;  
6 heating to a second temperature of about 752°F at a second heating ramp rate  
7 of about 212°F/hour;  
8 heating to a third temperature of about 1652°F at a third heating ramp rate of  
9 about 347°F/hour;  
10 maintaining the third temperature for about 7 hours; and  
11 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
12 of about minus 210°F/hour.

1 Claim 13 (original): The method of Claim 6, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of about 302°F at a first heating ramp rate of  
4 about 122°F/hour; and  
5 maintaining the first temperature for about an hour.

1 Claim 14 (original): The method of Claim 13, wherein the ramping step further  
2 comprises:  
3 heating to a second temperature of about 752°F at a second heating ramp rate  
4 of about 212°F/hour.

1 Claim 15 (original): The method of Claim 14, wherein the ramping step further  
2 comprises:  
3 heating to a third temperature of about 1652°F at a third heating ramp rate of  
4 about 347°F/hour; and  
5 maintaining the temperature for about 7 hours.

1 Claim 16 (original): The method of Claim 15, wherein the ramping step further  
2 comprises:  
3 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
4 of about minus 210°F/hour.

1 Claim 17 (original): The method of Claim 7, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of from about 302°F at a first heating ramp rate  
4 of about 122°F/hour;  
5 maintaining the first temperature for about an hour;  
6 heating to a second temperature of about 752°F at a second heating ramp rate  
7 of about 212°F/hour;

8           heating to a third temperature of about 1652°F at a third heating ramp rate of  
9   about 347°F/hour;  
10          maintaining the third temperature for about 7 hours; and  
11          allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
12   of about minus 210°F/hour.

1   Claim 18 (original): The method of Claim 7, wherein the ramping step further  
2   comprises:

3           heating to a first temperature of about 302°F at a first heating ramp rate of  
4   about 122°F/hour; and  
5           maintaining the first temperature for about an hour.

1   Claim 19 (original): The method of Claim 18, wherein the ramping step further  
2   comprises:

3           heating to a second temperature of about 752°F at a second heating ramp rate  
4   of about 212°F/hour.

1   Claim 20 (original): The method of Claim 19, wherein the ramping step further  
2   comprises:

3           heating to a third temperature of about 1652°F at a third heating ramp rate of  
4   about 347°F/hour; and  
5           maintaining the temperature for about 7 hours.

1 Claim 21 (original): The method of Claim 20, wherein the ramping step farther  
2 comprises:

3 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
4 of about minus 210°F/hour.

1 Claim 22 (original): The method of Claim 2, wherein the temperature of the HCl acid  
2 solution is maintained at ambient.

1 Claim 23 (original): The method of Claim 22, wherein the ceramic substrate is  
2 immersed in the HCl acid solution for about 15 minutes to an hour.

1 Claim 24 (currently amended): A method for removing a metallic layer formed from at  
2 least one metal from ~~the~~ a surface of a ceramic substrate, said method comprising  
3 the steps of:

4 immersing the ceramic substrate coated with the metallic layer formed from  
5 one metal in an acid solution of up to 31% hydrochloric acid (HCl) by volume for a  
6 time to remove at least a portion of the metallic layer therefrom; and

7 annealing the ceramic substrate subsequent to said immersion step at an  
8 elevated temperature sufficient to at least reduce pre-existing damage in the surface  
9 of the substrate.

1 Claim 25 (original): The method of Claim 24, wherein the acid solution comprises  
2 hydrochloric acid at a concentration of up to 31 % by volume of the solution.

1 Claim 26 (original): The method of Claim 24, wherein the acid solution comprises  
2 hydrochloric acid at a concentration of about 31 % by volume of the solution.

1 Claim 27 (original): The method of Claim 24, wherein the metallic layer further  
2 comprises a composite layer formed from an aluminum coating in contact with the  
3 ceramic substrate and a tantalum deposition overlaying the aluminum coating.

1 Claim 28 (original): The method of Claim 24, wherein the annealing step further  
2 comprises ramping the temperature using at least one predetermined heating ramp  
3 rate.

1 Claim 29 (original): The method of Claim 28, wherein the ramping step further  
2 comprises:

3 heating to a first temperature of about 302°F at a first heating ramp rate of  
4 about 122°F/hour;

5 maintaining the first temperature for about an hour;

6 heating to a second temperature of about 752°F at a second heating ramp rate  
7 of about 212°F/hour;

8 heating to a third temperature of about 1652°F at a third heating ramp rate of  
9 about 347°F/hour;

10 maintaining the third temperature for about 7 hours; and

11 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
12 of about minus 210°F/hour.

1 Claim 30 (original): The method of Claim 28, wherein the ramping step further  
2 comprises:

3 heating to a first temperature of about 302°F at a first heating ramp rate of  
4 about 122°F/hour; and

5 maintaining the first temperature for about an hour.

1 Claim 31 (original): The method of Claim 30, wherein the ramping step further  
2 comprises:

3 heating to a second temperature of about 752°F at a second heating ramp rate  
4 of about 212°F/hour.

1 Claim 32 (original): The method of Claim 31, wherein the ramping step further  
2 comprises:

3 heating to a third temperature of about 1652°F at a third heating ramp rate of  
4 about 347°F/hour; and

5 maintaining the third temperature for about 7 hours.

1 Claim 33 (original): The method of Claim 32, wherein the ramping step further  
2 comprises:

3 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
4 of about minus 210°F/hour.

1 Claim 34 (original): The method of Claim 26, wherein the temperature of the HCl acid  
2 solution is maintained at ambient.



1 Claim 35 (original): The method of Claim 34, wherein the ceramic substrate is  
2 immersed in the HCl acid solution for about 15 minutes to an hour.

1 Claim 36 (original): The method of Claim 25, wherein the heat treating step further  
2 comprises ramping the temperature using at least one predetermined heating ramp  
3 rate.

1 Claim 37 (original): The method of Claim 36, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of from about 302°F at a first heating ramp rate  
4 of about 122°F/hour;  
5 maintaining the first temperature for about an hour;  
6 heating to a second temperature of about 752°F at a second heating ramp rate  
7 of about 212°F/hour;  
8 heating to a third temperature of about 1652°F at a third heating ramp rate of  
9 about 347°F/hour;  
10 maintaining the third temperature for about 7 hours; and  
11 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
12 of about minus 210°F/hour.

1 Claim 38 (original): The method of Claim 36, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of about 302°F at a first heating ramp rate of  
4 about 122°F/hour; and

5           maintaining the temperature for about an hour.

1    Claim 39 (original): The method of Claim 38, wherein the ramping step further  
2    comprises:

3           heating to a second temperature of about 752°F at a second heating ramp rate  
4    of about 212°F/hour.

1    Claim 40 (original): The method of Claim 39, wherein the ramping step further  
2    comprises:

3           heating to a third temperature of about 1652°F at a third heating ramp rate of  
4    about 347°F/hour; and

5           maintaining the temperature for about 7 hours.

1    Claim 41 (original): The method of Claim 40, wherein the ramping step further  
2    comprises:

3           allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
4    of about minus 210°F/hour.

1    Claim 42 (currently amended) A method for refurbishing a deposition ring comprising  
2    a ceramic substrate coated with a metallic composite layer having an aluminum layer  
3    in contact with ~~the~~ a surface of the ceramic substrate and a tantalum layer in  
4    deposited over the aluminum layer, said method comprising the steps of:

5           immersing the ceramic substrate coated with the metallic composite layer in a  
6   solution of up to 31% hydrochloric acid (HCl) by volume, for a time to remove at least  
7   a portion of the metallic layer therefrom;  
8           removing the ceramic substrate from the acid solution;  
9           rinsing the ceramic substrate in a rinse solution;  
10          drying the substrate; and  
11          coating the ceramic substrate with a new metallic layer.

1   Claim 43 (original): The method of Claim 42, further comprising, before said coating  
2   step, the step of annealing the ceramic substrate at a predetermined temperature for  
3   a sufficient time to at least reduce damage or defects in the surface of the ceramic  
4   substrate.

1   Claim 44 (original): The method of Claim 42, further comprising after said rinsing  
2   step, the step of immersing said substrate in an acid bath solution of  $\text{HNO}_3$  and HF to  
3   remove stains, whereafter another step of rinsing is made.

1   Claim 45 (original): The method of Claim 44, wherein the acid bath solution contains  
2   equal parts of  $\text{H}_2\text{O}$ ,  $\text{HNO}_3$  and HF.

1   Claim 46 (original): The method of Claim 44, further comprising before said coating  
2   step, the step of drying said substrate at a predetermined temperature for a  
3   predetermined time.

1 Claim 47 (original): The method of Claim 46, wherein said predetermined  
2 temperature is 250°F, and said predetermined time is about an hour.

1 Claim 48 (original): The method of Claim 43, wherein the annealing step further  
2 comprises ramping the temperature using at least one predetermined heating ramp  
3 rate.

1 Claim 49 (original): The method of Claim 48, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of from about 302°F at a first heating ramp rate  
4 of about 122°F/hour;  
5 maintaining the first temperature for about an hour;  
6 heating to a second temperature of about 752°F at a second heating ramp rate  
7 of about 212°F/hour;  
8 heating to a third temperature of about 1652°F at a third heating ramp rate of  
9 about 347°F/hour;  
10 maintaining the third temperature for about 7 hours; and  
11 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
12 of about minus 210°F/hour.

1 Claim 50 (original): The method of Claim 48, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of about 302°F at a first heating ramp rate of  
4 about 122°F/hour; and

5           maintaining the first temperature for about an hour.

1    Claim 51 (original): The method of Claim 50, wherein the ramping step further  
2    comprises:

3           heating to a second temperature of about 752°F at a second heating ramp rate  
4    of about 212°F/hour.

1    Claim 52 (original): The method of Claim 51, wherein the ramping step further  
2    comprises:

3           heating to a third temperature of about 1652°F at a third heating ramp rate of  
4    about 347°F/hour; and

5           maintaining the third temperature for about 7 hours.

1    Claim 53 (original): The method of Claim 52, wherein the ramping step further  
2    comprises:

3           allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
4    of about minus 210°F/hour.

1    Claim 54 (original): The method of Claim 42, wherein the acid solution is about 31 %  
2    HCl.

3

1 Claim 55 (currently amended): A method for refurbishing a deposition ring  
2 comprising a ceramic substrate coated with a metallic composite layer having an  
3 aluminum layer in contact with ~~the~~ a surface of the ceramic substrate and a tantalum  
4 layer in deposited over the aluminum layer, said method comprising the steps of:  
5 immersing the ceramic substrate coated with the metallic composite layer in an  
6 acid solution of up to 31% hydrochloric acid (HCl) by volume, for a sufficient time to  
7 substantially remove the metallic layer therefrom;  
8 removing the ceramic substrate from the acid solution;  
9 rinsing the ceramic substrate in a rinse solution;  
10 drying the substrate;  
11 annealing the ceramic substrate at a predetermined temperature for a  
12 sufficient time to at least reduce damage or defects in the surface of the ceramic  
13 substrate; and  
14 coating the ceramic substrate with a new metallic layer.

1 Claim 56 (original): The method of Claim 55, wherein the acid solution includes about  
2 31% hydrochloric acid.

1 Claim 57 (original): The method of Claim 56, wherein the annealing step further  
2 comprises ramping the temperature using at least one predetermined heating ramp  
3 rate.

1 Claim 58 (original): The method of Claim 57, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of from about 302°F at a first heating ramp rate  
4 of about 122°F/hour;  
5 maintaining the first temperature for about an hour;  
6 heating to a second temperature of about 752°F at a second heating ramp rate  
7 of about 212°F/hour;  
8 heating to a third temperature of about 1652°F at a third heating ramp rate of  
9 about 347°F/hour;  
10 maintaining the third temperature for about 7 hours; and  
11 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
12 of about minus 210°F/hour.

1 Claim 59 (original): The method of Claim 57, wherein the ramping step further  
2 comprises:  
3 heating to a first temperature of about 302°F at a first heating ramp rate of  
4 about 122°F/hour; and  
5 maintaining the first temperature for about an hour.

1 Claim 60 (original): The method of Claim 59, wherein the ramping step further  
2 comprises:  
3 heating to a second temperature of about 752°F at a second heating ramp rate  
4 of about 212°F/hour.

1 Claim 61 (original): The method of Claim 60, wherein the ramping step further  
2 comprises:  
3 heating to a third temperature of about 1652°F at a third heating ramp rate of  
4 about 347°F/hour; and  
5 maintaining the third temperature for about 7 hours.

1 Claim 62 (original): The method of Claim 61, wherein the ramping step further  
2 comprises:  
3 allowing to cool to a fourth temperature of about 100°F at a cooling ramp rate  
4 of about minus 210°F/hour.